Design procedure for animal mortality composting system.

Step	Description
A	Determine the average daily weight of animal mortalities to be composted: 1. Multiple livestock species can be composted together, unless a dangerously contagious or reportable disease is suspected (see listing on page 52 of *Ohio's Livestock and Poultry Mortality Composting Manual*). Bio-security measures must be considered in the siting and operation to prevent disease transmission. 2. Use farm records for building capacity, animal sizes and livestock production values and loss records when possible; or calculate the Livestock Mortality Rates (from NRCS OH-ENG-233a, 233swine or 233poultry) developed for the various livestock species. 3. For swine facilities the following assumptions should be used if operator records are not available: • Each sow yields 2.5 litters of pigs per year • Each litter = 10 pigs • For finish operations, the number of hogs = 2.7 x farm building capacity 4. The average daily death loss should be determined for each growth stage on the farm. Where death loss is not constant throughout the year or species are not on the farm for the entire year, the average daily loss calculations need to be modified. Refer to form 233a. 5. Pounds of mortality produced from operations in one year using "**average weight"**. 6. Average daily loss in pounds per day to be composted. For some livestock operations the mortality rate is not constant throughout the year. See form NRCS OH-ENG –233a.
B	Determine the Composting Cycle times for the **"design weight"** to be composted in each windrow or bin. Note that the time for Primary Composting as well as the needed composting volume increases as the animal weight increases. For an operation with different growth stages, segregated bins or windrows should be evaluated for feasibility. Consider separate facilities for animals within these weight ranges: less than 50 lb., 50 to 250 lb., and greater than 250 lb. For animals exceeding 500 to 600 pounds the windrow composting method is preferred because individual primary bins would be large and the placement of animals would be difficult. For mature cattle or horses, a pile on a composting pad for each individual mortality is preferred. The following equations are solved in Tables 1 through 3. 1. Primary Cycle Time (in days) = 5 x (Design Animal Weight)$^{1/2}$, Minimum Time ≥ 10 days 2. Secondary Cycle Time (in days) = 1/3 Primary Cycle Time, Minimum Time ≥ 10 days 3. Storage Time ≥ 30 days (Needs to be considered when land application is not feasible immediately following completion of secondary cycle)
C	Determine the needed composter volumes using NRCS OH-ENG-234a or 235a. The following equations are solved in Tables 1 through 3. 1. Primary Composter volume (in ft^3) = 0.2 x Average daily loss (in lb./day) x Primary Cycle Time (days) 2. Secondary Composter Volume = 0.2 x Average daily loss (in lb./day) x Secondary Cycle Time (days) 3. Storage Volume = 0.2 x Average daily loss x 30 days *Note: For large animals use alternate equations in NRCS OH-ENG-234a or 235a*
D	Determine the dimensions of the compost facility, bin dimensions, and windrow size or number of bins using NRCS OH-ENG-234a or 235a. Note, in a bin system, the minimum front dimension (width) should be 2 ft. greater than the loading bucket width. Also as an alternative to building individual secondary bins, a large area to accommodate more than one primary bin can be used. This bin is generally directly behind the primary bins. Standard NRCS Drawing OH-N-506-CAD is an example of this configuration.
E	Determine the annual sawdust requirement for the composting system using NRCS OH-ENG-234a or 235a. This calculation assumes all sawdust needs are met with fresh sawdust. In practice, it is recommended that up to 50% of the fresh sawdust needs be met with finished compost.